This master should be used by designers working on Port of Portland construction projects and by designers working for PDX tenants (“Tenants”). Usage notes highlight a few specific editing choices, however the entire section should be evaluated and edited to fit specific project needs.

SECTION 260536 – CABLE TRAYS FOR ELECTRICAL SYSTEMS

1. GENERAL
	* + 1. DESCRIPTION
				1. This section describes providing complete cable tray systems as shown on the drawings.
				2. Cable tray systems include, but are not limited to straight sections, fittings, drop-outs, supports, and accessories.
			2. RELATED WORK SPECIFIED ELSEWHERE
				1. Section 260526, Grounding and Bonding for Electrical Systems
				2. Section 260529, Hangers and Supports for Electrical Systems
			3. REFERENCES
				1. NEC: National Electric Code

Article 392, Cable Trays

* + - * 1. NEMA: National Electrical Manufacturers Association:

NEMA VE 1-2017 - Metal Cable Tray Systems

NEMA VE 2-2018 - Cable Tray Installation Guidelines

* + - * 1. NFPA: National Fire Protection Association

NFPA 70 – National Electrical Code

* + - 1. SUBMITTALS
				1. Product Data: Submit tray type, fittings, and accessories.
				2. Shop Drawings: Indicate tray type, dimensions, support points, and finishes.
				3. Project Record Documents: Record actual routing of cable tray and locations of supports.
			2. QUALITY ASSURANCE
				1. Manufacturers: Firms regularly engaged in manufacture of cable trays and fittings of types and capacities required, whose products have been in satisfactory use in similar service for not less than 10 years.
				2. NEC Compliance: Comply with NEC, as applicable to construction and installation of cable tray and cable channel systems (Article 392, NEC).
				3. NEMA Compliance: Comply with NEMA Standards Publication Number VE1-2017, “Cable Tray Systems” and VE2-2018, “Cable Tray Installation Guidelines.”
				4. NFPA Compliance: Comply with NFPA 70B, “Recommended Practice for Electrical Equipment Maintenance” pertaining to installation of cable tray systems.
				5. UL Compliance: Provide products that are UL-classified and labeled.
			3. DELIVERY, STORAGE AND HANDLING
				1. Deliver cable tray systems and components in a manner as to avoid breakage, denting, and scoring finishes. Do not install damaged equipment.
				2. Store cable trays and accessories in original cartons and in clean dry space; protect from weather and construction traffic. Wet materials shall be unpacked and dried before storage.
1. PRODUCTS
	* + 1. ACCEPTABLE MANUFACTURERS
				1. Manufacturer: Subject to compliance with these specifications, cable tray and cable channel systems shall be as manufactured by Eaton’s B-Line Business, or pre-bid approved equal.
				2. Product Basis of Design: Eaton’s B-Line Business - Kwik Splice Series Cable Tray.
			2. CABLE TRAY SYSTEM

Edit brackets in paragraphs below as applicable to the project.

* + - * 1. Ladder cable trays shall consist of two longitudinal members (side rails) with transverse members (rungs) welded to both side rails. Both side rails and rungs shall be I-beam configuration. Side rails shall have a splice retention groove to accept a splice plate. Rungs shall be spaced [4] [6] [9] [12] inches on center. Rung spacing in radiused fittings shall be industry standard 9 inches and measured at the center of the tray’s width. Each rung must be capable of supporting a 200 lb. concentrated load on top of the catalogued design load at the center of an 18-inch wide cable tray (with a safety factor of 1.5).
				2. Ventilated bottom cable trays shall consist of two longitudinal members (side rails) with rungs spaced 4 inches on center.
				3. Solid bottom cable trays shall consist of two longitudinal members (side rails) with a solid sheet over rungs spaced on 12-inch centers.
				4. Cable tray loading depth shall be [3] [4] [5] inches in accordance with NEMA VE-1.
				5. Straight sections shall be supplied in standard 10- and 12-foot lengths.
				6. Cable tray widths shall be [6] [9] [12] [18] [24] [30] [36] inches or as shown on drawings.
				7. Splice plates shall have a maximum of two nuts and bolts per plate. The resistance of fixed splice connections between adjacent sections of tray shall not exceed 0.00033 ohms. Splice plates shall be furnished with straight sections and fittings.

All fittings shall have a minimum radius of [12] [24] inches.

* + - 1. LOADING CAPACITIES

Select required loading capacity of tray(s) as applicable to the project.

* + - * 1. Cable trays shall meet NEMA class designation: NEMA 12A: 50 lbs./ft. on a 12 ft. span or NEMA 12B: 75 lbs./ft. on a 12 ft. span.
			1. ACCESSORIES
				1. Covers:

Furnish only where indicated on the drawings.

Solid or ventilated as indicated.

Same manufacturer and material as the tray.

Secure covers with manufacturer’s approved clamps.

Clamp spacing in accordance with manufacturer’s recommendations.

* + - * 1. Dividers: Manufactured by the cable tray manufacturer of the same material as the tray.
				2. Mounting Hardware: Zinc-coated tray bolts, nuts, and fasteners; quantity shall not exceed two each per splice plate.
				3. Trapeze Supports: Manufactured by the cable tray manufacturer of the same material as the tray.
				4. Cable Exit Options: Radiused drop-outs must be utilized for cables exiting the cable tray through the rungs or over either side rail
1. EXECUTION
	* + 1. INSTALLATION
				1. Install cable trays as indicated: Installation shall be in accordance with equipment manufacturer’s instructions, and with recognized industry practices to ensure that cable tray equipment comply with requirements of NEC and applicable portions of NFPA 70B. Reference NEMA-VE2 for general cable tray installation guidelines.
				2. Coordinate cable tray with other work as necessary to properly integrate installation of cable tray work.
				3. Provide sufficient space encompassing cable trays to permit access for installing and maintaining cables. Provide a minimum of 12 inches of top clearance unless specifically approved by the Port.
				4. Cable tray fitting supports shall be located such that they meet the strength requirements of straight sections. Install fitting supports in accordance with NEMA VE-2 guidelines, or in accordance with manufacturer's instructions.
			2. TESTING
				1. Test cable trays to ensure electrical continuity of bonding and grounding connections, and to demonstrate compliance with specified maximum grounding resistance. See NFPA 70B, Chapter 18, for testing and test methods.
				2. Provide test reports of the “worst case” loading conditions outlined in this specification and performed in accordance with the latest revision of NEMA VE-1/CSA C22.2 No. 126. 1-09.
				3. Submit test reports to the Port for approval.

END OF SECTION 260536